

# Exothermic vs Exothermic

## Exo**thermic**

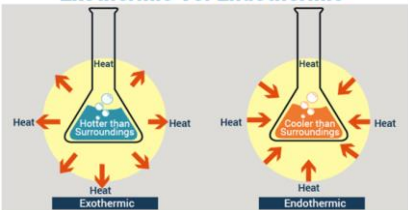
In some reactions more energy comes OUT than goes in



The reactants have more energy than the products.

e.g. combustion, oxidation, neutralisation.

### Exothermic Vs. Endothermic



## Endo**thermic**

In some reactions more energy goes IN than comes out.



The products have more energy than the reactants.

e.g. thermal decomposition

## Uses

### Exo**thermic**

Self heating cans, hand warmers



Chemicals react in an exothermic reaction and give OUT heat energy.

### Endo**thermic**

Cool packs for sports injuries

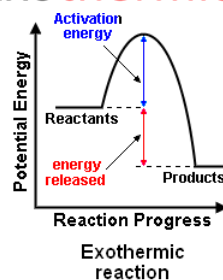


Chemicals react in an Endothermic reaction and take IN heat energy – therefore cooling the surroundings.

## C7 Energy Changes

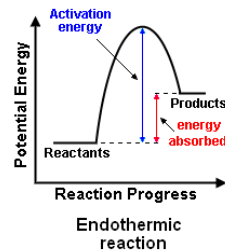
## Reaction Profiles

### Exo**thermic**



Products at LOWER energy than reactants

### Endo**thermic**



Products at HIGHER energy than reactants

**Activation Energy** is the energy needed to start a reaction.

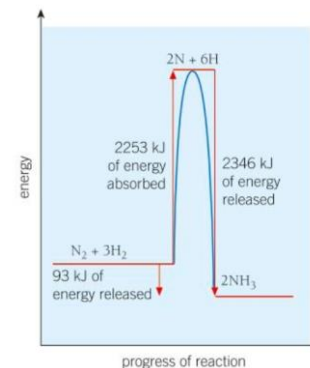
## Bond energy Calculations (HT)

### BINMIX

Bond **B**reaking is e**N**dothermic  
Bond **M**aking is e**X**othermic

### Exo**thermic**

More energy comes OUT making bonds



### Endo**thermic**

More energy goes IN breaking bonds